

Cm WHAT IS CLAIMED IS:

1. An apparatus for end-to-end data communications where data is transported via incompatible transmission formats between a remote device and a host communication network using a wireless communications link in a manner that is transparent to said remote device, said host communication network, and attendant applications of said host communication network, comprising:

a mobile data controller interfacing said remote device with said wireless communications link, said mobile data controller comprising remote data conversion means for converting data to be transported between said remote device and said host communication network, said remote data conversion means converting said transported data between a remote device transmission format utilized by said remote device and one of a plurality of digital and analog wireless link transmission formats utilized by said wireless communications link;

network interface means for interfacing said host communication network with said wireless communications link, said network interface means comprising a network protocol-appropriate communication controller logically residing on said host communication network, and converting said transported data between said one of a plurality of wireless link transmission formats and a host network format utilized by said host communication network,

wherein said remote device transmission format, said wireless link transmission format, said host network format are dissimilar formats.

2. An apparatus for transporting data according to claim 1, wherein said network interface means comprises a remote network controller.

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3. An apparatus for transporting data according to claim 2, wherein said remote network controller is adapted to be connectable to a plurality of different types of host communication networks having distinct transmission characteristics.
 4. An apparatus for transporting data according to claim 1, wherein said mobile data controller is adapted to be connectable to a plurality of different types of remote devices having distinct operational characteristics.
 5. An apparatus for transporting data according to claim 1, further comprising a plurality of said network interface means connected by a local network and a synchronization means for synchronizing the transfer of information between said network interface means, said information comprising routing tables and health and status information.
 6. An apparatus for transporting data according to claim 1, further comprising means for detecting and correcting errors in transmission of said transported data between said remote device and said host communication network.
 7. An apparatus for transporting data according to claim 1, wherein said network interface means comprises a plurality of wireless communication interface means adapted to transfer said transported data to a plurality of wireless communications links.
 8. An apparatus for transporting data according to claim 1, wherein said network interface means further comprises a plurality of host network communication interface means adapted to transfer said transported data to a plurality of host communication networks.
 9. An apparatus for transporting data according to claim 1 further comprising:
a system for determining link selection criteria;

a selection system for dynamically selecting one of a plurality of incompatible wireless communications links in accordance with the link selection criteria; and

a switching system for switching to the selected wireless communications link to use for data transport.

5 10. An apparatus for transporting data according to claim 9 in which the data is transported via a plurality of protocols comprising at least Internet Protocol (IP), and transparent protocol over the plurality of incompatible wireless communications links, the transportation of data being transparent to the remote device and an end user.

10 11. An apparatus for transporting data according to claim 9 further comprising a system interfacing protocolized data into the plurality of incompatible wireless communications links using different protocols.

15 12. An apparatus for transporting data according to claim 9 in which the switching system switches wireless communications links immediately after transporting a first data packet and before transporting a subsequent consecutive data packet.

20 13. An apparatus for transporting data according to claim 9 in which the system for determining link selection criteria comprises two classes of parameters.

25 14. An apparatus for transporting data according to claim 9 in which the selection system further determines a next wireless communications link from the plurality of incompatible wireless communications links in accordance with the link selection criteria when the selected wireless communications link becomes unavailable.

15. The apparatus for transporting data according to claim 14 further comprising a monitoring system which monitors the availability of the plurality of

incompatible wireless communications links to determine whether the next wireless communications link is available for data transport.

16. A method of end-to end data communications where data is transported via incompatible transmission formats in a transparent manner between a remote device and a host communication network using a wireless communications link, said remote device and said wireless communications link being connected to a mobile data controller, said host communication network and said wireless communications link being interfaced by a network interface device logically residing on said host communication network as a protocol-appropriate communications controller, said method comprising the steps of:

converting data to be transported between said remote device and said host communication network, said converting step converting said transported data between a remote device transmission format utilized by said remote device and one of a plurality of digital and analog wireless link transmission formats utilized by said wireless communications link;

transporting said transported data over said wireless communications link in accordance with said one of said wireless link transmission formats;

receiving said transport data from said wireless communications link;

converting said transported data between said one of said wireless link transmission formats and a network interface format utilized by said network interface device, said one of said wireless link transmission formats and said host network format being incompatible;

further converting said transported data between said network interface format and a host network format utilized by said host communication network; and

forwarding said transported data to said host communication network in accordance with said host network format.

17. The method of data communication according to claim 16 in which the transporting further comprises:

- 5 determining wireless communications link selection criteria;
10 dynamically selecting a wireless communications link from a plurality of incompatible wireless communications links in accordance with the selection criteria;
15 switching to the selected wireless communications link; and
20 continuously repeating the following:
25 dynamically selecting a next wireless communications link from the plurality of incompatible networks in accordance with the selection criteria;
30 determining whether to switch wireless communications links; and
35 switching to the next wireless communications link in response to a result of the determination.

18. An apparatus for end-to-end data communications where data is transported via incompatible transmission formats in a transparent manner between a remote device and a host communication network using a wireless communications link, comprising:

- 20 a mobile data controller communicating over said wireless communications link to said host communication network, said mobile data controller comprising a remote device communication interface module which converts data to be transported between said remote device and said host communication network, said remote device communication interface module converting said transported data between a remote device transmission format utilized by said remote device and one of a plurality of

analog and digital wireless link transmission formats utilized by said wireless communications link;

5 a network protocol-appropriate communication controller logically residing on said host communication network, said network controller comprising a wireless link conversion device which converts said transported data between said one of a plurality of wireless link transmission formats a host network format utilized by said host communication network,

10 wherein said remote device transmission format, said wireless link transmission format, said network interface format and said host network format are dissimilar formats.

15 19. An apparatus for transporting data according to claim 18, wherein said network interface device comprises a remote network controller.

20 20. An apparatus for transporting data according to claim 19, wherein said remote network controller is connectable to a plurality of different types of host communication networks having distinct transmission characteristics.

25 21. An apparatus for transporting data according to claim 18, wherein said mobile data controller is connectable to a plurality of different types of remote devices having distinct operational characteristics.

22. An apparatus for transporting data according to claim 18, further comprising a plurality of said network interface devices connected by a local network and a synchronization device for synchronizing the transfer of information between said network interface devices, said information comprising routing tables and health and status information.

23. An apparatus for transporting data according to claim 18, wherein said network interface device further comprises a plurality of wireless communication

interface devices adapted to transfer said transported data to a plurality of wireless communications links.

24. An apparatus for transporting data according to claim 18, wherein said network interface device further comprises a plurality of host network communication interface devices adapted to transfer said transported data to a plurality of host communication networks.

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25. An apparatus for transporting data according to claim 18 further comprising:

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a system for determining link selection criteria;
a selection system for dynamically selecting one of a plurality of incompatible wireless communications links in accordance with the link selection criteria; and
a switching system for switching to the selected wireless communications link to use for data transport.

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26. An apparatus for transporting data according to claim 25 in which the data is transported via a plurality of protocols comprising at least Internet Protocol (IP), and transparent protocol over the plurality of incompatible wireless communications links, the transportation of data being transparent to the remote device and an end user.

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27. An apparatus for transporting data according to claim 25 further comprising a system interfacing protocolized data into the plurality of incompatible wireless communications links using different protocols.

28. An apparatus for transporting data according to claim 25 further comprising a system interfacing protocolized data into the plurality of incompatible wireless communications links using different protocols.

29. An apparatus for transporting data according to claim 25 in which the system for determining link selection criteria comprises two classes of parameters.

5 30. An apparatus for transporting data according to claim 25 in which the selection system further determines a next wireless communications link from the plurality of incompatible wireless communications links in accordance with the link selection criteria when the selected wireless communications link becomes unavailable.

10 31. An apparatus for transporting data according to claim 30 further comprising a monitoring system which monitors the availability of the plurality of incompatible wireless communications links to determine whether the next wireless communications link is available for data transport.

15 32. An apparatus for transporting data over a plurality of incompatible networks between a first device and a second device comprising:

 a system for determining network selection criteria;

 a selection system for dynamically selecting one of the plurality of incompatible networks in accordance with the network selection criteria; and

 a switching system for switching to the selected network to use for data transport.

20 33. An apparatus for transporting data according to claim 32 in which the data is transported via a plurality of protocols comprising at least Internet Protocol (IP), and transparent protocol over the plurality of incompatible networks, the transportation of data being transparent to the devices and an end user.

25 34. An apparatus for transporting data according to claim 32 further comprising a system interfacing protocolized data into the plurality of incompatible networks using different protocols.

35. An apparatus for transporting data according to claim 32 in which the switching system switches networks immediately after transporting a first data packet and before transporting a subsequent consecutive data packet.

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36. An apparatus for transporting data according to claim 32 in which the system for determining network selection criteria comprises two classes of parameters.

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37. An apparatus for transporting data according to claim 32 in which the selection system further determines a next network from the plurality of incompatible networks in accordance with the network selection criteria when the selected network becomes unavailable.

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38. An apparatus for transporting data according to claim 37 further comprising a monitoring system which monitors the availability of the plurality of incompatible networks to determine whether the next network is available for data transport.

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